

Patent claims:

1. Core-shell particle which has a core, a first shell and, where appropriate, a second shell,  
5 where:

i) the core encompasses, based on its total weight, at least 75.0% by weight of (meth)acrylate repeat units;

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ii) the first shell has a glass transition temperature below 30°C;

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iii) the second shell present where appropriate encompasses, based on its total weight, at least 75.0% by weight of (meth)acrylate repeat units;

characterized in that

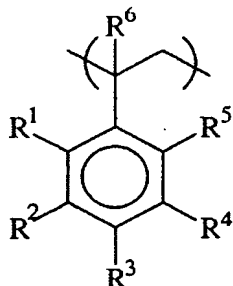
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iv) the first shell encompasses, based on its total weight, the following constituents;

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E) from 92.0 to 98.0% by weight of (meth)acrylate repeat units and

F) from 2.0 to 8.0% by weight of styrenic repeat units of the general formula (I)



(I)

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where each of the radicals R<sup>1</sup> to R<sup>5</sup>, independently of the others, is hydrogen, a halogen, a C<sub>1-6</sub>-alkyl group or a C<sub>2-6</sub>-alkenyl group and the radical R<sup>6</sup> is hydrogen or an alkyl group having from 1 to 6 carbon atoms,

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where the percentages by weight of E) and F) give a total of 100.0% by weight,

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and in that

v) the radius of the core-shell particle inclusive of any second shell present, measured by the Coulter method, is in the range from above 160.0 to 240.0 nm.

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2. Core-shell particle according to Claim 1,  
characterized in that, based in each case on its  
total weight,
- i) the proportion of the core is from 5.0 to  
5 50.0% by weight,
  - ii) the proportion of the first shell is from  
20.0 to 75.0% by weight and
  - iii) the proportion of the second shell is from  
0.0 to 50.0% by weight,
- 10 where the percentages by weight give a total of  
100.0% by weight.
3. Core-shell particle according to Claim 1 or 2,  
characterized in that the core encompasses, based  
15 in each case on its total weight,
- A) from 50.0 to 99.9% by weight of alkyl  
methacrylate repeat units having from 1 to 20  
carbon atoms in the alkyl radical,
  - B) from 0.0 to 40.0% by weight of alkyl acrylate  
20 repeat units having from 1 to 20 carbon atoms  
in the alkyl radical,
  - C) from 0.1 to 2.0% by weight, of crosslinking  
repeat units and
  - D) from 0.0 to 8.0% by weight of styrene repeat  
25 units of the general formula (I),

where the percentages by weight give a total of 100% by weight.

4. Core-shell particle according to Claim 3,  
5 characterized in that the core comprises, based in  
each case on its total weight, from 80.0 to 99.9%  
by weight of methyl methacrylate repeat units and  
from 1.0 to 20.0% by weight of alkyl acrylate  
repeat units having from 1 to 4 carbon atoms in  
10 the alkyl radical, where the percentages by weight  
give a total of 100.0% by weight.

5. Core-shell particle according to at least one of  
the preceding claims, characterized in that the  
15 first shell encompasses, based in each case on its  
total weight,

E-1) from 90.0 to 97.9% by weight of alkyl  
acrylate repeat units having from 3 to 8  
carbon atoms in the alkyl radical and/or  
20 alkyl methacrylate repeat units having from 7  
to 14 carbon atoms in the alkyl radical;

E-2) from 0.1 to 2.0% by weight of  
crosslinking repeat units and

F) from 2.0 to 8.0% by weight of styrenic  
25 repeat units of the general formula (I),

where the percentages by weight give a total of 100.0% by weight.

6. Core-shell particle according to Claim 5,  
5 characterized in that the alkyl acrylate repeat units having from 3 to 8 carbon atoms in the alkyl radical and/or alkyl methacrylate repeat units having from 7 to 14 carbon atoms in the alkyl radical are butyl acrylate repeat units and/or  
10 dodecyl methacrylate repeat units.

7. Core-shell particle according to at least one of the preceding claims, characterized in that it has a second shell which, based in each case on its  
15 total weight, encompasses

G) from 50.0 to 100.0% by weight of alkyl methacrylate repeat units having from 1 to 20 carbon atoms in the alkyl radical,

H) from 0.0 to 40.0% by weight of alkyl  
20 acrylate repeat units having from 1 to 20 carbon atoms in the alkyl radical and

I) from 0.0 to 8.0% by weight of styrenic repeat units of the general formula (I),

where the percentages by weight give a total of  
25 100.0% by weight.

8. Core-shell particle according to at least one of the preceding claims, characterized in that the core has a glass transition temperature of at least 30°C.
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9. Core-shell particle according to at least one of the preceding claims, characterized in that it has a second shell, which has a glass transition temperature of at least 30°C.
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10. Process for preparing a core-shell particle according to at least one of the preceding claims 1 to 9, characterized in that a multistage emulsion polymerization is carried out.
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11. Moulding composition comprising, based in each case on its total weight:
- A) from 1.0 to 50.0% by weight of at least one core-shell particle according to at least one of Claims 1 to 9;
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- B) from 1.0 to 99.0% by weight of at least one (meth)acrylic polymer,
- C) from 0.0 to 45% by weight of styrene-acrylonitrile copolymers, and
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- D) from 0.0 to 10.0% by weight of other additives

where the percentages by weight give a total of 100.0% by weight.

12. Moulding composition according to Claim 11,  
5 characterized in that the (meth)acrylic) [sic] polymer encompasses, based in each case on its total weight,  
a) from 50.0 to 100.0% by weight of alkyl methacrylate repeat units having from 1 to 20  
10 carbon atoms in the alkyl radical,  
b) from 0.0 to 40.0% by weight of alkyl acrylate repeat units having from 1 to 20 carbon atoms in the alkyl radical and  
c) from 0.0 to 8.0% by weight of styrenic repeat  
15 units of the general formula (I),  
where the percentages by weight give a total of 100.0% by weight.
13. Moulding composition according to Claim 11 or 12,  
20 characterized in that the moulding composition comprises styrene-acrylonitrile copolymers, where the styrene-acrylonitrile copolymers were obtained by polymerizing any mixture which is composed of  
from 70 to 92% by weight of styrene  
25 from 8 to 30% by weight of acrylonitrile and

from 0 to 22% by weight of other comonomers, based in each case on the total weight of the monomers to be polymerized.

5 14. Moulding composition according to at least one of  
Claims 11 to 13, characterized in that it  
comprises, based on its total weight, from 0.1 to  
10.0% by weight of another polymer whose weight-  
average molecular weight is higher by at least 10%  
10 than that of the (meth)acrylic polymer B) [sic].

15. Moulding obtainable from a moulding composition  
according to at least one of Claims 11 to 14.



16. Moulding according to Claim 15, characterized in that the moulding has a Vicat softening point to ISO 306 (B50) of at least 85°C, with preference at least 90°C and with particular preference at least 93°C, a notched impact strength NIS (Izod 180/1eA) to ISO 180 of at least 5.8 kJ/m<sup>2</sup> at 23°C and of at least 3.7 kJ/m<sup>2</sup> at -20°C, a modulus of elasticity to ISO 527-2 of at least 1500 MPa.
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17. Moulding according to Claim 14, characterized in that the moulding is a mirror housing or a spoiler on a motor vehicle, a pipe, a film for sports items, or a protective covering or a component of a refrigerator.
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